

WHAT IS CLAIMED IS:

1. An optical glass for polarizing optical system having a photoelastic constant  $C$  in the range of  $-0.2$  to  $+0.5$  [ $10^{-8}$   $\text{cm}^2/\text{N}$ ] with respect to a wavelength of 633 nm, the optical glass having the following composition (1):

composition (1): when represented in terms of wt.% of oxides:

$\text{SiO}_2$ : 17.0 - 27.0 % (35.5 - 57.0 mol%)

$\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O}$ : 0.5 - 5.0 % (0.7 - 20.0 mol%)

$\text{PbO}$ : 72.0 - 75.0 % (39.1 - 45.0 mol%)

$\text{As}_2\text{O}_3 + \text{Sb}_2\text{O}_3$ : 0.1 - 3.0 % (0.1 - 2.0 mol%).

2. An optical glass for polarizing optical system having a photoelastic constant  $C$  in the range of  $-0.2$  to  $+0.5$  [ $10^{-8}$   $\text{cm}^2/\text{N}$ ] with respect to a wavelength of 633 nm, the optical glass having the following composition (2):

composition (2): when represented in terms of mol%:

$\text{SiO}_2$ : 40.0 - 54.0 mol%

$\text{R}_2\text{O}$  (R: alkali metal): 0.5 - 9.0 mol%

$\text{PbO}$ : 43.0 - 45.5 mol%

$\text{As}_2\text{O}_3 + \text{Sb}_2\text{O}_3$ : 0.1 - 1.5 mol%; and

the composition (2) further containing fluorine in the following range when represented in terms of mol%:

fluorine/oxygen (F/O) ratio: 0.1 - 18.0.

3. An optical glass for polarizing optical system

having a photoelastic constant  $C$  in the range of  $-0.2$  to  $+0.5$  [ $10^{-8}$  cm<sup>2</sup>/N] with respect to a wavelength of 633 nm, the optical glass having the following composition (3):

composition (3) when represented in terms of mol%:

SiO<sub>2</sub>: 40.0 - 54.0 mol%

R<sub>2</sub>O (R: alkali metal): 0.5 - 9.0 mol%

RF: 0 - 16.0 mol%

R<sub>2</sub>SiF<sub>6</sub>: 0 - 3.3 mol%

PbO + PbF<sub>2</sub>: 43.0 - 45.5 mol%

PbF<sub>2</sub>: 0 - 10.0 mol%

As<sub>2</sub>O<sub>3</sub> + Sb<sub>2</sub>O<sub>3</sub>: 0.1 - 1.5 mol%; and

the composition (3) further containing fluorine in the following range in terms of mol%:

fluorine/oxygen (F/O) ratio: 0.1 - 18.0.

4. A process for producing an optical glass for polarizing optical system, the process comprising:

changing the ratio of PbO in a lead-containing optical glass to control the photoelastic constant  $C$  thereof to provide an optical glass for polarizing optical system having a photoelastic constant  $C$  in the range of  $-0.2$  to  $+0.5$  [ $10^{-8}$  cm<sup>2</sup>/N] with respect to a wavelength of 633 nm, the optical glass having the following composition (1):

composition (1): when represented in terms of wt.% of oxides:

SiO<sub>2</sub>: 17.0 - 27.0 % (35.5 - 57.0 mol%)

Li<sub>2</sub>O + Na<sub>2</sub>O + K<sub>2</sub>O: 0.5 - 5.0 % (0.7 - 20.0 mol%)

PbO: 72.0 - 75.0 % (39.1 - 45.0 mol%)

As<sub>2</sub>O<sub>3</sub> + Sb<sub>2</sub>O<sub>3</sub>: 0.1 - 3.0 % (0.1 - 2.0 mol%).

5

5. A process for producing an optical glass for polarizing optical system, the process comprising:

changing the fluorine/oxygen (F/O) ratio of a fluorine-containing optical glass so as to regulate the refractive index thereof while retaining the photoelastic constant C of the optical glass in the range of substantially zero to provide an optical glass for polarizing optical system having a photoelastic constant C in the range of -0.2 to +0.5 [10<sup>-8</sup> cm<sup>2</sup>/N] with respect to a wavelength of 633 nm,

10

15

the optical glass having the following composition (2):

composition (2): when represented in terms of mol%:

SiO<sub>2</sub>: 40.0 - 54.0 mol%

R<sub>2</sub>O (R: alkali metal): 0.5 - 9.0 mol%

20

PbO: 43.0 - 45.5 mol%

As<sub>2</sub>O<sub>3</sub> + Sb<sub>2</sub>O<sub>3</sub>: 0.1 - 1.5 mol%; and

the composition (2) further containing fluorine in the following range when represented in terms of mol%:

fluorine/oxygen (F/O) ratio: 0.1 - 18.0.

25

6. A process for producing an optical glass for

polarizing optical system, the process comprising:

changing the fluorine/oxygen (F/O) ratio of a fluorine-containing optical glass so as to regulate the refractive index thereof while retaining the photoelastic constant C of the optical glass in the range of substantially zero to provide an optical glass for polarizing optical system having a photoelastic constant C in the range of -0.2 to +0.5 [ $10^{-8}$  cm<sup>2</sup>/N] with respect to a wavelength of 633 nm, the optical glass having the following composition

(3):

composition (3) when represented in terms of mol%:

SiO<sub>2</sub>: 40.0 - 54.0 mol%

R<sub>2</sub>O (R: alkali metal): 0.5 - 9.0 mol%

RF: 0 - 16.0 mol%

R<sub>2</sub>SiF<sub>6</sub>: 0 - 3.3 mol%

PbO + PbF<sub>2</sub>: 43.0 - 45.5 mol%

PbF<sub>2</sub>: 0 - 10.0 mol%

As<sub>2</sub>O<sub>3</sub> + Sb<sub>2</sub>O<sub>3</sub>: 0.1 - 1.5 mol%; and

the composition (3) further containing fluorine in the following range in terms of mol%:

fluorine/oxygen (F/O) ratio: 0.1 - 18.0.